Multiplex

Pulsar 40i, 60i, 80i, 100i
Circuit Carbonators

USER, INSTALLATION & MAINTENANCE MANUAL

PRODUCT CODE	PULSAR 40i - 02-22XX-XXXX
	PULSAR 60i - 02-23XX-XXXX
	PULSAR 80i - 02-24XX-XXXX
	PULSAR 100i - 02-25XX-XXXX
MANUAL PART No.	P156909
MANUAL REVISION:	REV 1

DATE: 12/10/11

EC Declaration of Conformity
EC Guideline Electro Magnetic Compatibility 2004/108/EC
Machinery Directive 2006/42/EC has been fulfilled.

The safety targets regarding the Low Voltage Directive 2006/95/EC according to the following co-ordinated standards have been applied:

BSEN 60335-1:2002 +A14:2010 – Refrigeration, Household Safety
BSEN 60335-2-89:2003 – Refrigeration, Motors and Pumps

Household and Similar Electrical Appliances – Safety (particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor)

BSEN61000-6-3:2001 Electromagnetic emissions compatibility (EMC)- Generic standards.

BSEN61000-6-1:2001 Radiated and Immunity compatibility (EMC) – Generic standards.

CE

2011 Manitowoc
continuing product improvements may necessitate change of specification without notice.

Head Office
Manitowoc Beverage Systems
Chancel Way, Halesowen
West Midlands, B62 8SE, UK

Tel: +44.121.501.2566
Fax: +44.121.500.0873

www.manitowocbeverage.com
mbs.uk@manitowoc.com

Manitowoc

Manitowoc

Dear Customer

Please read these operating instructions carefully!
Examine the equipment immediately after supply for transport damages. Contact the manufacturer and/or carrier if necessary. Damage, which arises by inappropriate treatment or operation, is not subject to guarantee.

Manitowoc Beverage Systems constantly develop the products further according to their policies. Manitowoc Beverage Systems reserve therefore the right, to modify and to improve the products described in this documentation without previous announcement.

© 2009 Manitowoc Beverage Systems. All rights reserved.

Reproduction of any kind without previously written permission of Manitowoc Beverage is not allowed.

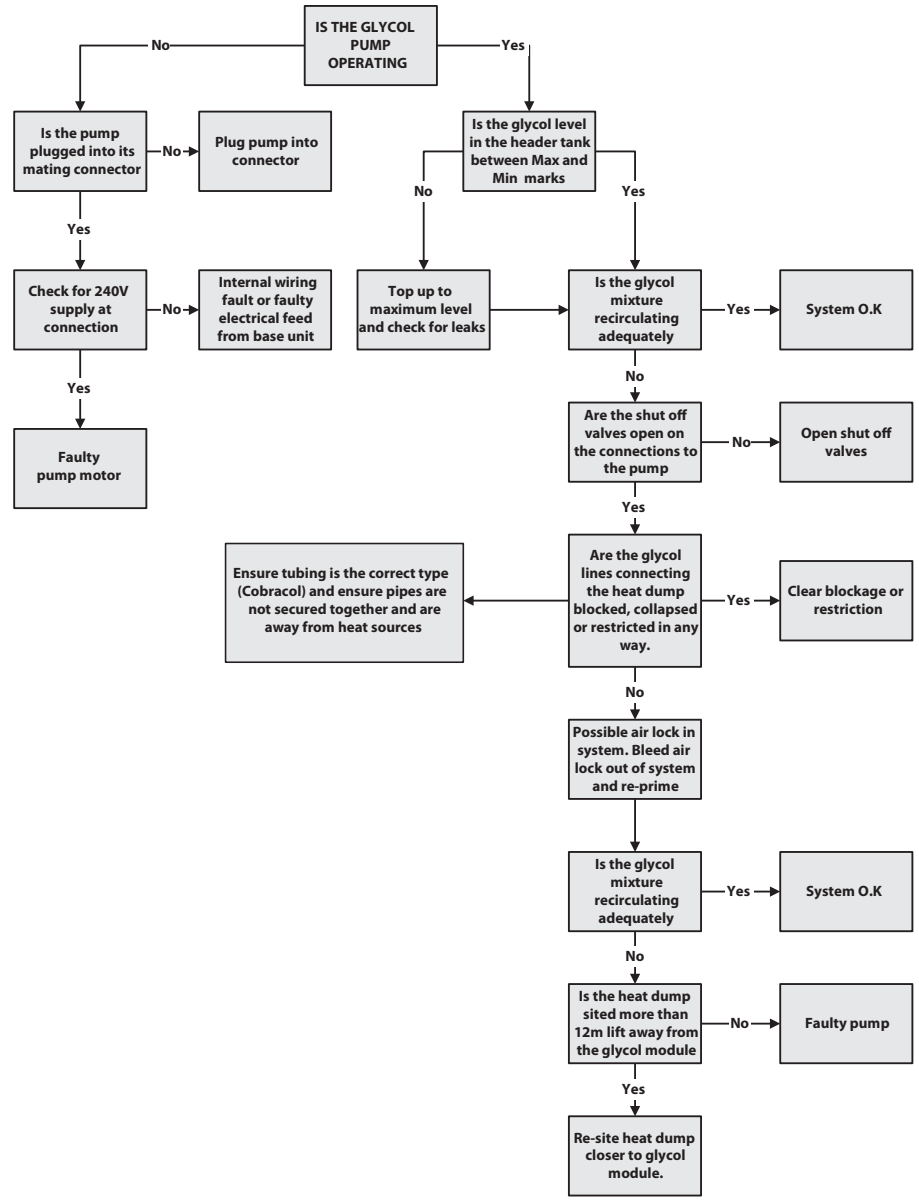
Pulsar is a brand of Manitowoc Beverage Systems.

All Other brand names specified in this documentation refer to the appropriate companies or their products Manitowoc Beverage systems are not the owner of those brand names.

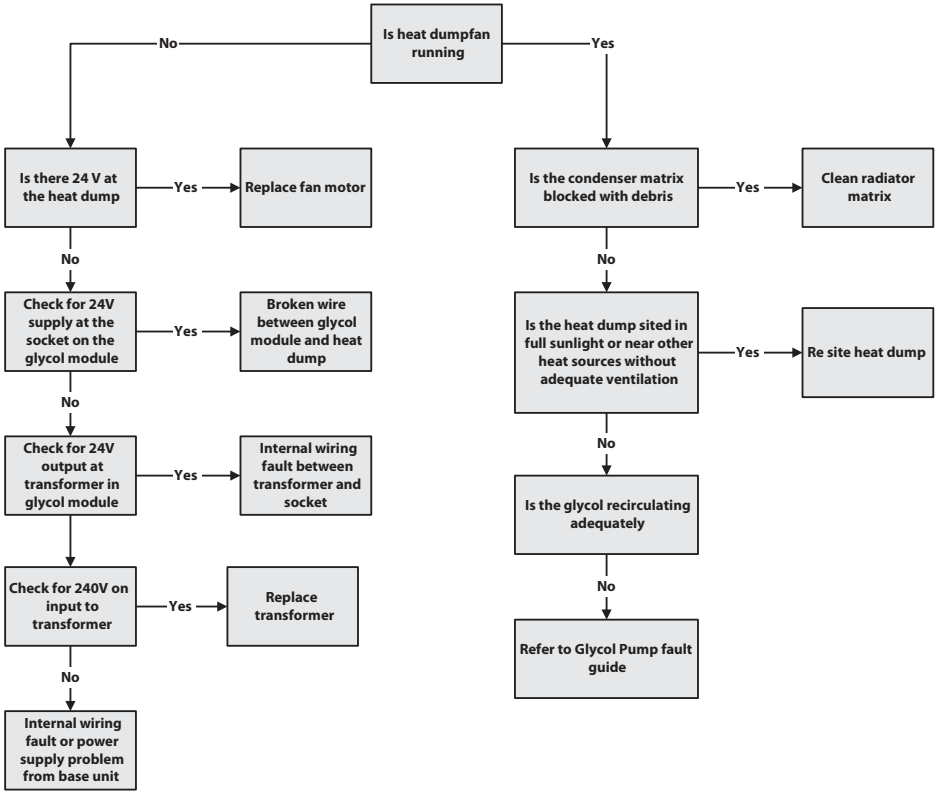
Please read the operating instructions carefully before operating this unit.

SECTION 1
Pepsi IntelliCarb standard 3
SECTION 2
Warning & Safety Instructions 3-10
SECTION 3
Technical Data 11
SECTION 4
Installation instructions 12-16
Heat dump and glycol module 15-16
Glycol module installation instructions 16-21
Water cooled unit - equipment connection schematic 17
Heat dump installation instructions 18-21
SECTION 5
Maintenance requirements 22-23
SECTION 6
Exploded drawing and spare parts of Pulsar i 24-25
SECTION 7
FOR QUALIFIED ENGINEERS ONLY
Exploded drawing and spare parts of Glycol Module 26
SECTION 8
FOR QUALIFIED ENGINEERS ONLY
Flow Diagram 27
SECTION 9
FOR QUALIFIED ENGINEERS ONLY
Wiring Diagram 28
SECTION 10
FOR QUALIFIED ENGINEERS ONLY
Fault Analysis 29
SECTION 11
FOR QUALIFIED ENGINEERS ONLY
Fault Diagnosis flow chart product too warm 30
Fault Diagnosis flow chart soda recirculation pump 31
Fault Diagnosis flow chart agitator motor 32
Fault Diagnosis flow chart refridgeneration system 33
Fault Diagnosis flow chart heat dump (water cooled units) 34
Fault Diagnosis flow chart glycol module (water cooled units) 35

FAULT DIAGNOSIS FLOW CHART GLYCOL MODULE (WATER COOLED UNITS)


IS THE GLYCOL PUMP OPERATING
No
Yes
Is the pump plugged into its mating connector
No
Plug pump into connector
Yes
Check for 240V supply at connection
No
Internal wiring fault or faulty electrical feed from base unit
Yes
Faulty pump motor
Is the glycol level in the header tank between Max and Min marks
No
Yes
Top up to maximum level and check for leaks
Is the glycol mixture recirculating adequately
Yes
System O.K
No
Are the shut off valves open on the connections to the pump
No
Open shut off valves
Yes
Are the glycol lines connecting the heat dump blocked, collapsed or restricted in any way.
Yes
Clear blockage or restriction
Ensure tubing is the correct type (Cobracol) and ensure pipes are not secured together and are away from heat sources
No
Possible air lock in system. Bleed air lock out of system and re-prime
Is the glycol mixture recirculating adequately
Yes
System O.K
No
Is the heat dump sited more than 12m lift away from the glycol module
No
Faulty pump
Yes
Re-site heat dump closer to glycol module.

FAULT DIAGNOSIS FLOW CHART HEAT DUMP (WATER COOLED UNITS)


Is heat dumpfan running
No
Yes
Is there 24 V at the heat dump
Yes
Replace fan motor
No
Check for 24V supply at the socket on the glycol module
Yes
Broken wire between glycol module and heat dump
No
Check for 24V output at transformer in glycol module
Yes
Internal wiring fault between transformer and socket
No
Check for 240V on input to transformer
Yes
Replace transformer
No
Internal wiring fault or power supply problem from base unit
Is the condenser matrix blocked with debris
Yes
Clean radiator matrix
No
Is the heat dump sited in full sunlight or near other heat sources without adequate ventilation
Yes
Re site heat dump
No
Is the glycol recirculating adequately
No
Refer to Glycol Pump fault guide

The Pepsi Intellicarb® Standard

Thank your for purchasing this product. You have chosen equipment which has been developed together with and approved by Pepsico to meet the new Intellicarb® standards. The Pepsi Intellicarb® standard marks a new quality benchmark for dispensed soft drinks.

To ensure that the quality of the dispensed drinks is as expected we recommend the following:

- Ensure that the CO_2 pressure is between 75 and 90 psi (5.1 – 6.1 bar).
- The use of high flow valves (i.e. Flomatic 464) to keep the break out of CO_2 during dispense as low as possible.
- Follow recommended brix ratios and flow rates.

If you have any questions or need technical support please contact us on the telephone numbers on the back of this manual.

⚠ Warning

WAYS THE EQUIPMENT SHOULD BE USED
THE UNITS ARE INTENDED FOR USE AS A COOLING AND RECIRCULATION UNIT FOR SYRUPS AND CARBONATED WATER TO PROVIDE THE CORRECT CONDITIONING FOR SERVING DRAUGHT SOFT DRINKS AND AS SUCH SHOULD ONLY BE USED FOR THAT PURPOSE. THERE ARE NO OTHER RECOMMENDED USES FOR THIS EQUIPMENT.

⚠ Warning

SAFETY INSTRUCTIONS
THE UNITS COMPLY WITH THE CURRENT STANDARDS AND REGULATIONS OF THE EU AND REPRESENT THE CURRENT STANDARD OF TECHNOLOGY.
SAFETY DURING INSTALLATION, OPERATION AND DECOMMISSIONING CAN ONLY BE ENSURED BY FOLLOWING THE INSTRUCTIONS IN THIS USER MANUAL.
ANY WORK OR MAINTENANCE MUST BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING SAFETY INSTRUCTIONS.
TECHNICAL CHANGES TO SAFETY OR ELECTRICAL DEVICES OR THE MAINS LEAD ARE STRICTLY FORBIDDEN. INSTALLATION, MAINTENANCE AND REPAIR ON THIS EQUIPMENT MUST BE CARRIED OUT BY SUITABLY TRAINED PERSONNEL.
ONLY USE GENUINE SPARE PARTS.
NON-COMPLIANCE WITH THESE INSTRUCTIONS MAY RESULT IN SERIOUS INJURY OR DEATH.

MANITOWOC AND ITS LEGAL ENTITIES ENSURE NO LIABILITY FOR DAMAGE CAUSED BY THE USE OF NON GENUINE SPARE PARTS OR BY IMPROPER TREATMENT OF THE EQUIPMENT.

⚠ Warning

SYSTEM PRESSURE
THE CARBONATOR IS AN INTEGRAL PART OF THE UNIT AND IT SHOULD BE NOTED THAT THE CARBONATION PROCESS INVOLVES THE USE OF HIGH PRESSURES AND POTENTIALLY NOXIOUS GAS AND AS SUCH DUE CARE SHOULD BE TAKEN WHEN HANDLING, INSTALLING AND MAINTAINING THE EQUIPMENT WITH PARTICULAR REGARD TO THESE HAZARDS.

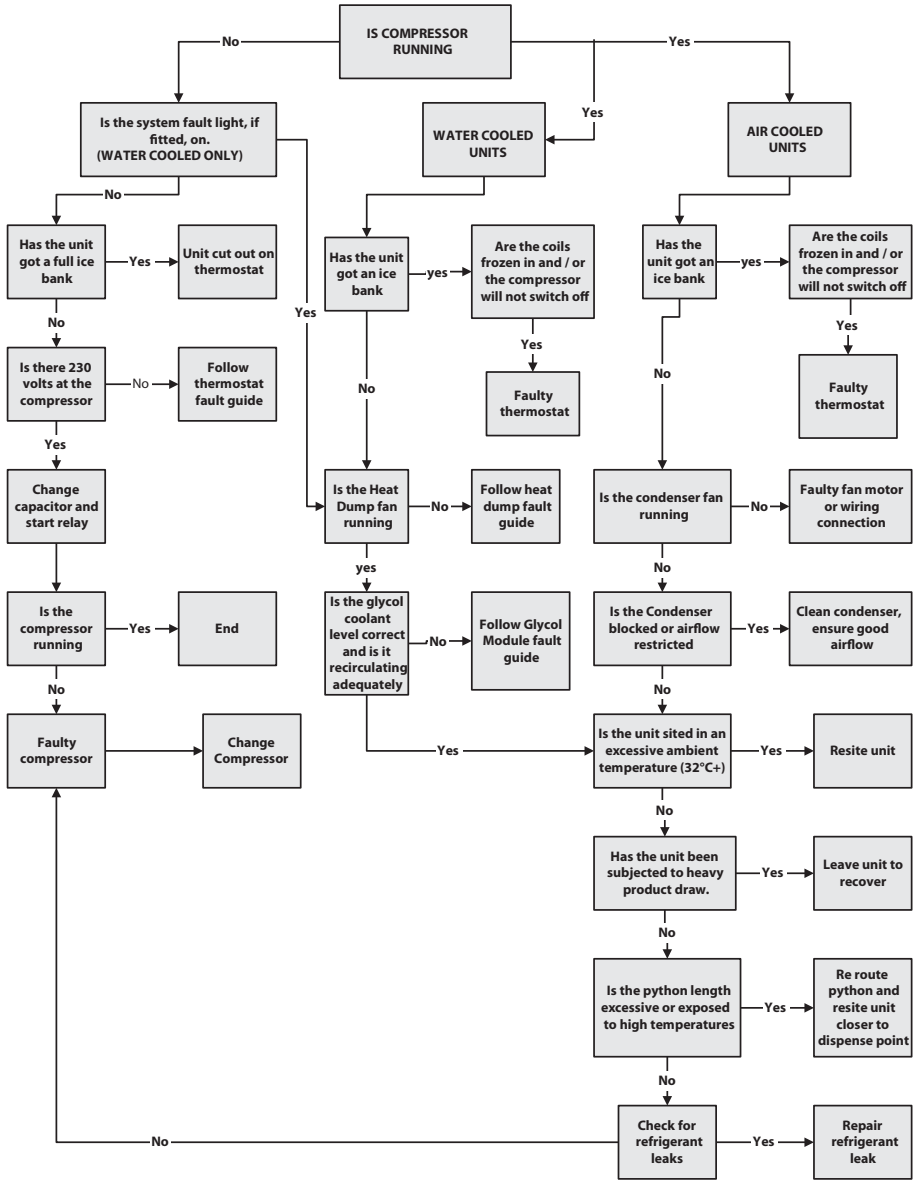
Warning

CARBON DIOXIDE

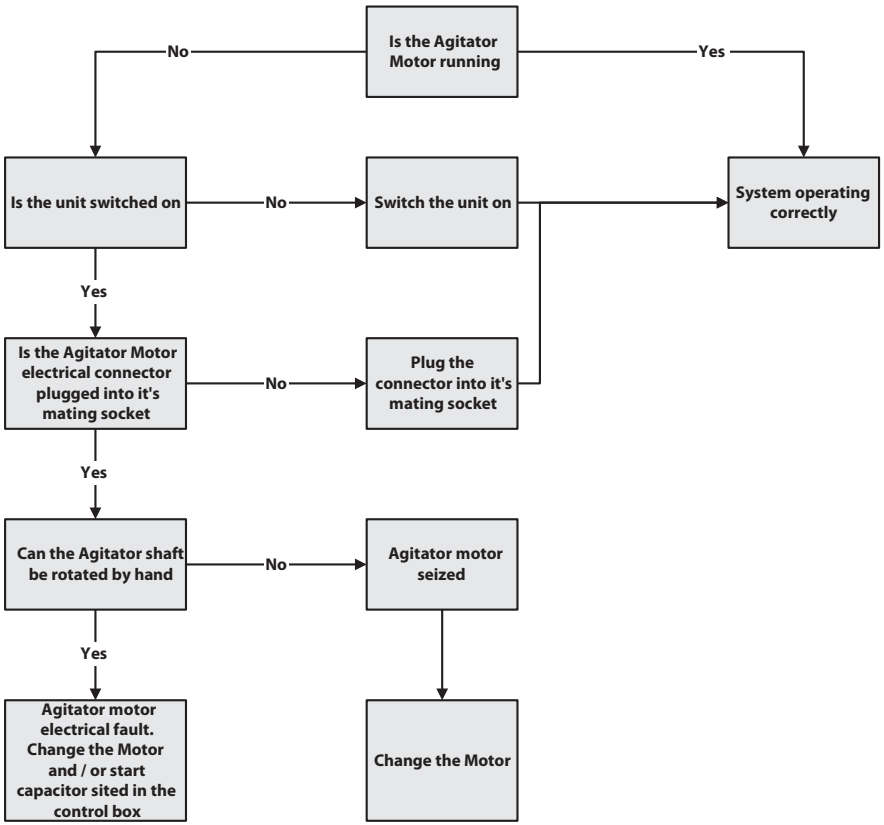
1. ALWAYS	Connect the CO_2 or gas cylinder to a REDUCING VALVE.
2. NEVER	Try to connect cylinder directly to product container.
3. NEVER	Interconnect soft drinks, CO_2 or gas cylinder equipment with other equipment.
4. ALWAYS	Secure cylinder upright whilst in use.
5. ALWAYS	Keep cylinder away from heat.
6. NEVER	Drop or throw cylinders.
7. NEVER	Try to unscrew fittings from containers.
8. ALWAYS	Ventilate area after CO_2 leakage.

This information should be displayed in a position adjacent to the CO_2 supply cylinder at all times.

FAULT DIAGNOSIS FLOW CHART REFRIGERATION SYSTEM



FAULT DIAGNOSIS FLOW CHART AGITATOR MOTOR


Is the Agitator Motor running
No
Yes
Is the unit switched on
No
Switch the unit on
System operating correctly
Yes
Is the Agitator Motor electrical connector plugged into it's mating socket
No
Plug the connector into it's mating socket
Yes
Can the Agitator shaft be rotated by hand
No
Agitator motor seized
Yes
Agitator motor electrical fault. Change the Motor and / or start capacitor sited in the control box
Change the Motor

⚠ Warning

CARBON DIOXIDE

CARBON DIOXIDE LEAKS ARE POTENTIALLY FATAL IF CONCENTRATIONS RISE TO DANGEROUS LEVELS, IN VIEW OF THIS, THE INSTALLATION SHOULD BE REGULARLY CHECKED FOR INTEGRITY AND THE GENERAL AREA OF INSTALLATION PROPERLY VENTILATED AT ALL TIMES.

⚠ Warning

WARNING:THIS EQUIPMENT MUST BE EARTHED

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

Green and Yellow.....Earth
Blue.....Neutral
Brown.....Live

As the Colours of the Wires in the Mains Lead of this Appliance may not correspond with the Coloured Markings identifying the Terminals in the Plug to be fitted, proceed as follows:

a) The wire which is coloured Green and Yellow MUST be connected to the terminal in the Plug that is marked with the letter, E™ or by the earth symbol coloured Green or Green and Yellow.

b) The wire which is coloured Blue MUST be connected to the Terminal in the Plug that is marked with the letter, N™ or coloured Black.

c) The wire which is coloured Brown MUST be connected to the Terminal in the Plug that is marked with the letter, L™ or coloured Red.

All mains voltage components are hazardous. Any electrical work must be carried out by a qualified competent person.

⚠ Warning

POWER ISOLATION METHOD

ALL UNITS ARE FITTED WITH A SINGLE PHASE 3 PIN 13 AMP PLUG. THE PULSAR 40 AND 60 ARE FITTED WITH A 10 AMP FUSE, THE PULSAR 80 AND 100 WITH A 13 AMP FUSE. ALTERNATIVELY, A STANDARD EURO PLUG TO **IEC83:1975.**

BEFORE COMMENCING ANY WORK/MAINTENANCE -

A) SWITCH OFF THE SOCKET THAT THE PLUG IS INSTALLED IN TO.
B) REMOVE THE PLUG FROM THE SOCKET.
C) A HEAT DUMP IS INCLUDED WITH ALL WATER COOLED UNITS. THE CONNECTING PLUG SHOULD BE REMOVED FROM THE GLYCOL MODULE.

Warning

ROTATING PARTS

SOME COMPONENTS WILL ROTATE FOR A SHORT PERIOD AFTER THE POWER TO THE UNIT HAS BEEN SWITCHED OFF. THESE COMPONENTS SHOULD BE AVOIDED UNTIL STATIONARY.

Warning

THIS EQUIPMENT CAN CONTRIBUTE TO AN INCREASE IN THE AMBIENT TEMPERATURE.

Warning

PUMP PRESSURE TO THE CARBONATOR BOWL CAN REACH 13.6 BAR (200PSI).

Warning

THIS APPLIANCE IS NOT INTENDED FOR USE BY PERSONS (INCLUDING CHILDREN) WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES, OR LACK OF EXPERIENCE AND KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING USE OF THE APPLIANCE BY A PERSON RESPONSIBLE FOR THEIR SAFETY.CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE.

Warning

DANGER BY LOW TEMPERATURES

THE EVAPORATION TEMPERATURE IN THE HERMETIC CIRCUIT CAN ACHIEVE EASILY -10°C. WITHOUT TAKING PREVENTIVE STEPS, THIS CAN BE A POTENTIAL SOURCE OF ACCIDENTS WHILST CLEANING OR MAINTENANCE OF PARTS AT SUCH TEMPERATURES.

Warning

HEAT

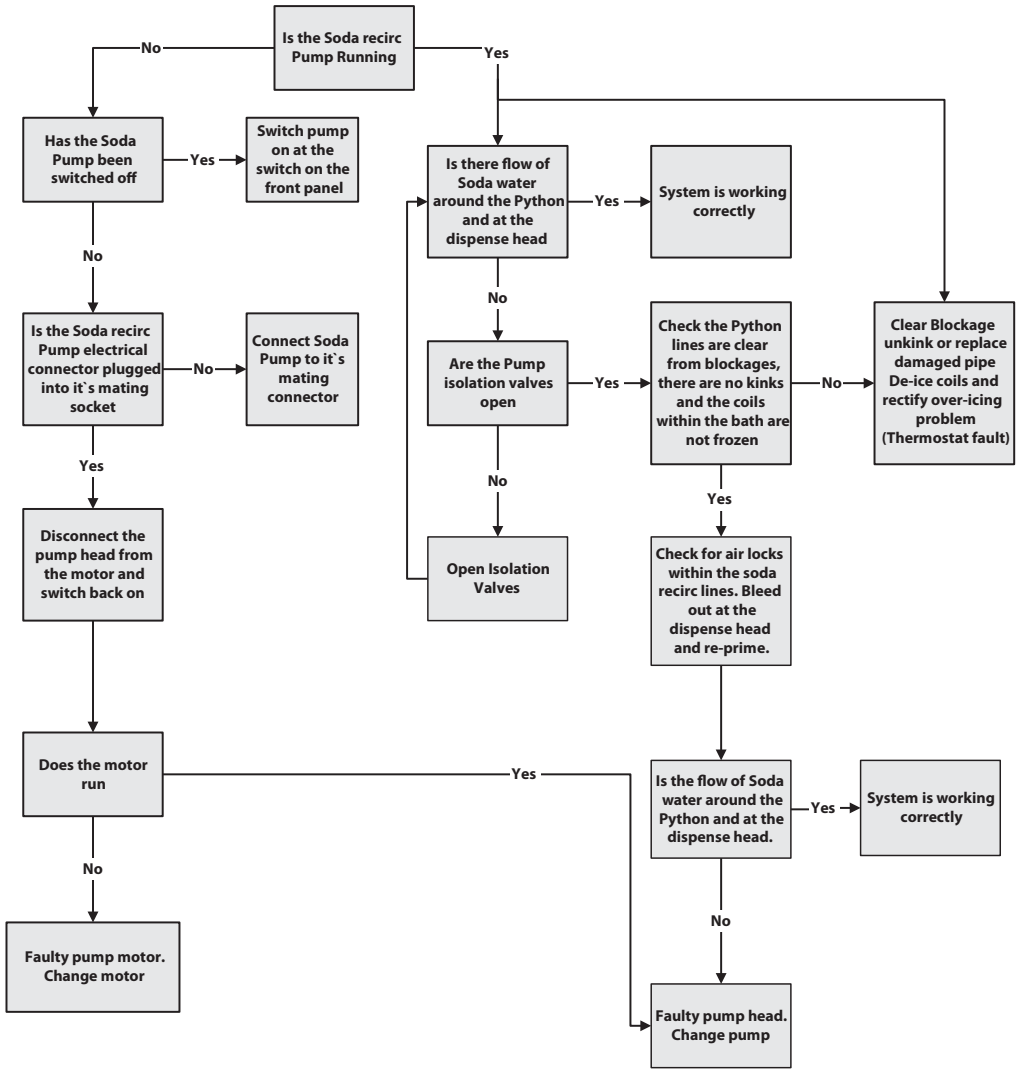
THE COMPRESSOR, CONDENSER, HIGH PRESSURE REFRIGERATION TUBES AND MOTORS WILL BECOME HOT DURING OPERATION. PLEASE AVOID ANY CONTACT TO THESE PARTS DURING AND AFTER OPERATION UNTIL THEY HAVE COOLED DOWN.

Warning

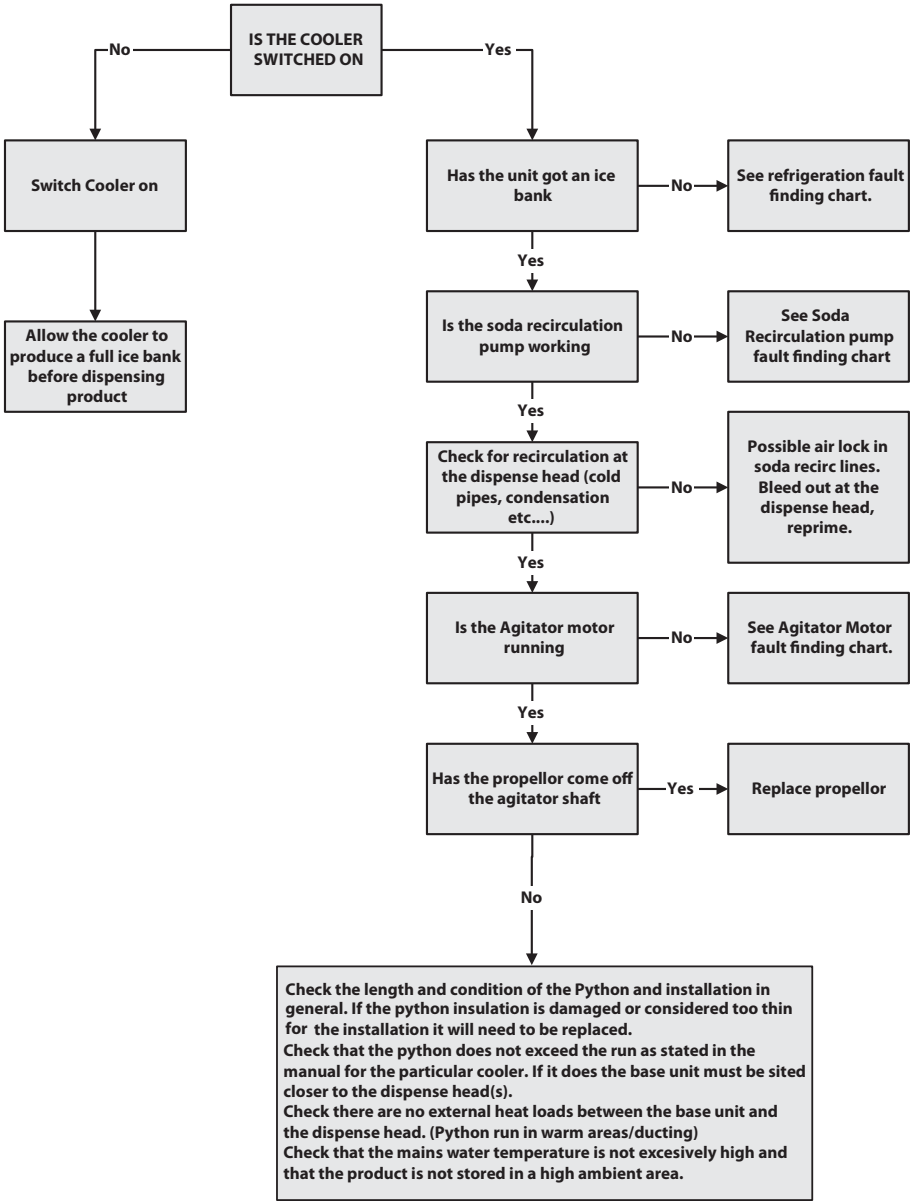
SHARP EDGES

MANITOWOC TRY TO AVOID ANY SHARP EDGES. BASED ON THE METHODS OF PRODUCTION AND THE MATERIAL USED THIS CAN NOT ALWAYS BE GUARANTEED. THEREFORE HANDLE THE UNIT WITH CARE TO AVOID POSSIBLE CUTS.

FAULT DIAGNOSIS FLOW CHART - SODA RECIRCULATION PUMP


Is the Soda recirc Pump Running
No
Yes
Has the Soda Pump been switched off
Yes
Switch pump on at the switch on the front panel
No
Is the Soda recirc Pump electrical connector plugged into it`s mating socket
No
Connect Soda Pump to it`s mating connector
Yes
Disconnect the pump head from the motor and switch back on
Does the motor run
No
Faulty pump motor. Change motor
Yes
Is there flow of Soda water around the Python and at the dispense head
Yes
System is working correctly
No
Are the Pump isolation valves open
Yes
Check the Python lines are clear from blockages, there are no kinks and the coils within the bath are not frozen
No
Clear Blockage unkink or replace damaged pipe De-ice coils and rectify over-icing problem (Thermostat fault)
Yes
Check for air locks within the soda recirc lines. Bleed out at the dispense head and re-prime.
No
Open Isolation Valves
Is the flow of Soda water around the Python and at the dispense head.
Yes
System is working correctly
No
Faulty pump head. Change pump

FAULT DIAGNOSIS FLOW CHART - PRODUCT TOO WARM


IS THE COOLER SWITCHED ON
No
Yes
Switch Cooler on
Allow the cooler to produce a full ice bank before dispensing product
Has the unit got an ice bank
No
See refrigeration fault finding chart.
Yes
Is the soda recirculation pump working
No
See Soda Recirculation pump fault finding chart
Yes
Check for recirculation at the dispense head (cold pipes, condensation etc....)
No
Possible air lock in soda recirc lines. Bleed out at the dispense head, reprime.
Yes
Is the Agitator motor running
No
See Agitator Motor fault finding chart.
Yes
Has the propellor come off the agitator shaft
Yes
Replace propellor
No
Check the length and condition of the Python and installation in general. If the python insulation is damaged or considered too thin for the installation it will need to be replaced.
Check that the python does not exceed the run as stated in the manual for the particular cooler. If it does the base unit must be sited closer to the dispense head(s).
Check there are no external heat loads between the base unit and the dispense head. (Python run in warm areas/ducting)
Check that the mains water temperature is not excesively high and that the product is not stored in a high ambient area.

CORRECT SAFE HANDLING

Pulsar 40i, 60i & 80i
The weight of ,these units is such that other than moving it across flat ground (which is facilitated by integral castors / wheels option) or lifting to a relatively safe height of 12" utilising two people, a mechanical lifting device should be used.

Pulsar 100i
The weights of this unit is such that other than moving it across flat ground (which is facilitated by integral castors / wheels) a mechanical lifting device should be used.

UNIT WEIGHTS

Pulsar 40i	Integral	75 kg (Dry)
Pulsar 40i	Water Cooled	73 kg (Dry)
Pulsar 60i	Integral	79 kg (Dry)
Pulsar 60i	Water Cooled	77 kg (Dry)
Pulsar 80i	Integral	92 kg (Dry)
Pulsar 80i	Water Cooled	90 kg (Dry)
Pulsar 100i	Integral	145 kg (Dry)
Pulsar 100i	Water cooled	143 kg (Dry)
GLYCOL MODULE		13 kg (Dry)
HEAT DUMP		9 kg (Dry)

⚠ Warning
ONLY LIFT THIS EQUIPMENT IN ITS DRY STATE

⚠ Warning
ADJUSTMENT / MAINTENANCE REQUIREMENTS
IT IS NOT RECOMMENDED THAT THE END USER MAKES ANY ADJUSTMENTS OR CARRIES OUT ANY MAINTENANCE OTHER THAN: CHECK THE MAINS LEAD AND PLUG VISUALLY FOR CONDITION.
CHECK THE UNIT AND ITS PIPEWORK FOR EVIDENCE OF LEAKS VISUALLY, INCLUDING THE HEAT DUMP.
CHECK THAT THE CONDENSER GRILL AND VENTS ARE NOT CHOKED OR OBSCURED, INCLUDING THE HEAT DUMP.
IF THERE IS ANY SPILLAGE OF LIQUID ONTO THE UNIT, ISOLATE THE POWER SUPPLY BEFORE CLEANING UP. MAKE ANY NECESSARY ADJUSTMENTS AS RECOMMENDED BY THE SYRUP SUPPLIER.

NOTE: THERE ARE NO USER SERVICEABLE PARTS

METHODS OF CLEANING

NOTE:
Persons performing Cleansing /Sanitizing operations MUST be competent and fully trained in safe methods of use of Cleansing / Sanitizing Agents and their applications.

Personal protective equipment should always be used.

Do not use a water or steam hose to clean the unit whilst still installed.

It is important that all the vents and grills are kept clear (including condenser grills where applicable) otherwise cooling performance decreases and the system overheats.

RECOMMENDED LINE CLEANING METHOD

IMPORTANT: Persons performing Cleansing /Sanitizing operations MUST be competent and fully trained in safe methods of use of Cleansing / Sanitizing Agents and their applications.

IMPORTANT: Personal Protective Equipment Should Always Be Used.

IMPORTANT: Do Not Use A Water Or Steam Hose To Clean The Unit Whilst Still Installed.

Clean and sanitize the cooling coils and product lines using a proprietary cleanser/sanitizer of the Alkaline Hypochlorite type, in accordance with the manufacturer's recommendations. MBS recommends the use of "Pipeline" beer line cleaner, which changes colour according to the condition of the product lines. It is available from beer and soft drinks wholesalers, or direct from:
Chemisphere UK Ltd, 143-149 Bath Road, Kettering, Northants NN16 8NE.
See above for detailed cleaning instructions.

Cleaning instructions for "Pipeline" beer line cleaner:

1. Draw clean water through the system until it all traces of product have disappeared.

2. Mix the beer line cleaner with clean water, in the ratio specified in the instructions [typically 1 capful per 4.5 litres (gallon)]. The solution will be purple in colour. NOTE: use the appropriate personal protective equipment, to avoid splash burns or damage to eyes from splashes.

3. Connect the line cleaning solution to the lines to be cleaned.

4. Draw the line cleaning solution through the dispense tap. If the lines are particularly contaminated with yeast or bacterial growth, the run-off will be green/grey/black.

5. Close the tap and leave for 10 minutes.

6. Repeat stages 4 and 5 twice, or until the run-off is purple in colour.

7. The purple colour denotes lines which are clean and free from contamination.

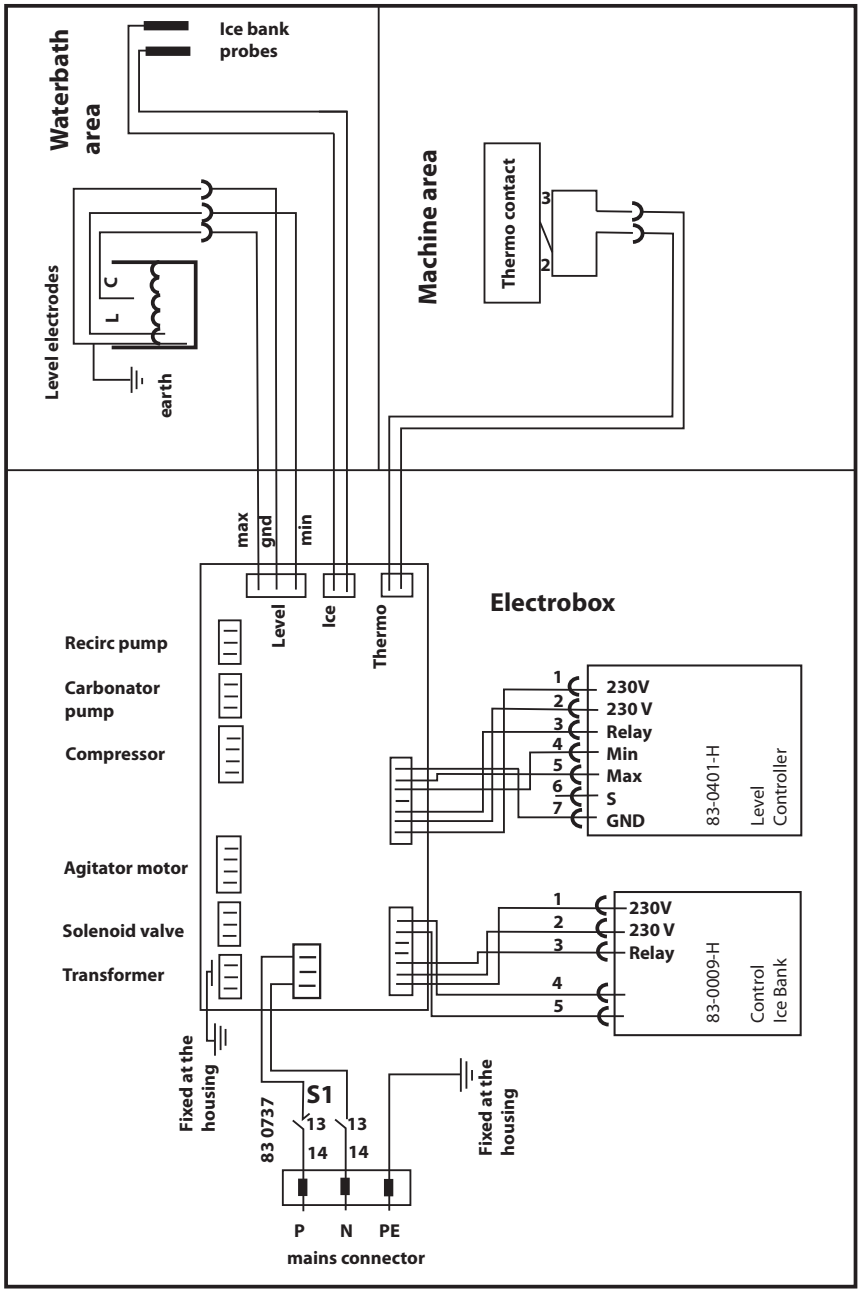
8. Disconnect the line cleaning solution and draw fresh water through the system. Dispense some water into a glass or other clear vessel and check that there is no purple colour remaining. If necessary, draw more clean water through the system until the run-off is clear.

9. The lines are now clean, safe and ready for reconnection to the product. Reconnect the Keg in the storage/cellar area and pull product through to the tap.

FAULT ANALYSIS

Kind of malfunction	Reason	Solution
Beverages too warm	Cooler switched off or not connected to mains electricity	Switch cooler on or insert plug
	Control damaged	Change Control
	Compressor defective	Change compressor (only skilled persons)
	Refrigerant leakage	Find and repair leakage and refill circuit (only skilled persons)
	Waterbath empty	Fill waterbath with clean water until over flow level is reached
	Recirculation pump defective or switched off	Exchange recirc pump or switch it on
	Dispense rate too high	Either reduce dispense rate or install larger capacity machine
	Condenser dirty or blocked	Clean condenser or remove restriction/blockage
	Agitator motor not working or blade missing	Replace agitator or blade
Beverage is foaming	Dispense rate too high	Reduce dispense rate
	Syrup too old or saturated	Change syrup
	Beverages too warm	Look at section "Beverages too warm"
Flat Drinks	CO_2-cylinder empty	Change CO_2-cylinder
	Pressure regulator is shut off	Open valve
	Pressure regulator frozen due to dispense rate too high	Either split CO_2-feed to several cylinders or install a pressure regulator heater
	Mains water pressure higher than CO_2-pressure	Modify pressure settings
Valve dispenses only gas	Carbonator pump defective	Exchange pump
	Water valve shut off or carbonator not connected to mains water	Open valve or connect unit to mains water
	Level control defect	Exchange level control
	Soda circuit frozen	Melt ice bank, search for the reason and repair (see section "soda circuit frozen")
Soda circuit frozen	Ice bank control defect	Change ice bank control
	Agitator defect	Change agitator
Beverage is too sweet	Wrong brix adjustment at dispense valve	Modify brix adjustment

WIRING DIAGRAM



ANNUALLY:
By a competent service/maintenance engineer.

Isolate unit from mains electricity supply. Remove any extraneous debris from the unit or its casing preferably using a vacuum cleaner or brush, including the heat dump. Check unit for electrical safety.

PREVENTION OF FREEZING / ACTION REQUIRED IF FREEZING OCCURS

It is recommended that the unit is sited In such a way as not to expose it to temperatures likely to cause freezing i.e. below 0°C. If the unit is to be sited in an unheated area then insulate all pipework and provide some form of emergency heating which should be controlled by a frost thermostat sited in close proximity to the unit.

It should be noted that heat dumps may require to be sited where freezing may occur which is why a 30% glycol \ water mixture is used as a coolant. Failure to adhere to this recommendation could result in damaging consequences. The concentration of the coolant should not be compromised, and in the event of spillage, the lost volume should be replenished with the correct mixture.

NOTE: A 30% glycol mixture is suitable for operation in temperatures as low as -12°C. For operation in temperatures as low as -25°C, a 50% glycol mixture is required. In the event of freezing up occurring the following action is recommended:

1. Isolate the unit from mains electricity supply.

2. Disconnect the heat dump power cable.

3. Isolate product supply from unit.

4. Vent pressure lines by opening dispense tap.

5. Isolate from heat dump (coolant lines) using service valve.

6. Apply gentle warmth to the general area of the unit and its pipework.

7. Check for obvious leaks.

8. Turn water supply on whilst continually watching for leaks.

9. Reconnect product supply.

10. Reconnect mains electricity supply and heat dump supply.

11. Observe unit running for a short period watching out for leaks, strange noises or any other form of malfunction. If no problems are observed then normal operation of the unit may be resumed.

MAX. / MIN. AMBIENT TEMPERATURES

COOLER UNIT:
Minimum +5°C Maximum +40°C
HEAT DUMP UNIT:
Minimum -25°C Maximum +40°C
(WITH A 50% GLYCOL MIXTURE)

MAX. / MIN. WATER PRESSURES

Minimum 20 PSI (1.4 BAR)
Maximum 60 PSI (4.1 BAR)

MAX. / MIN. CO_2 PRESSURES

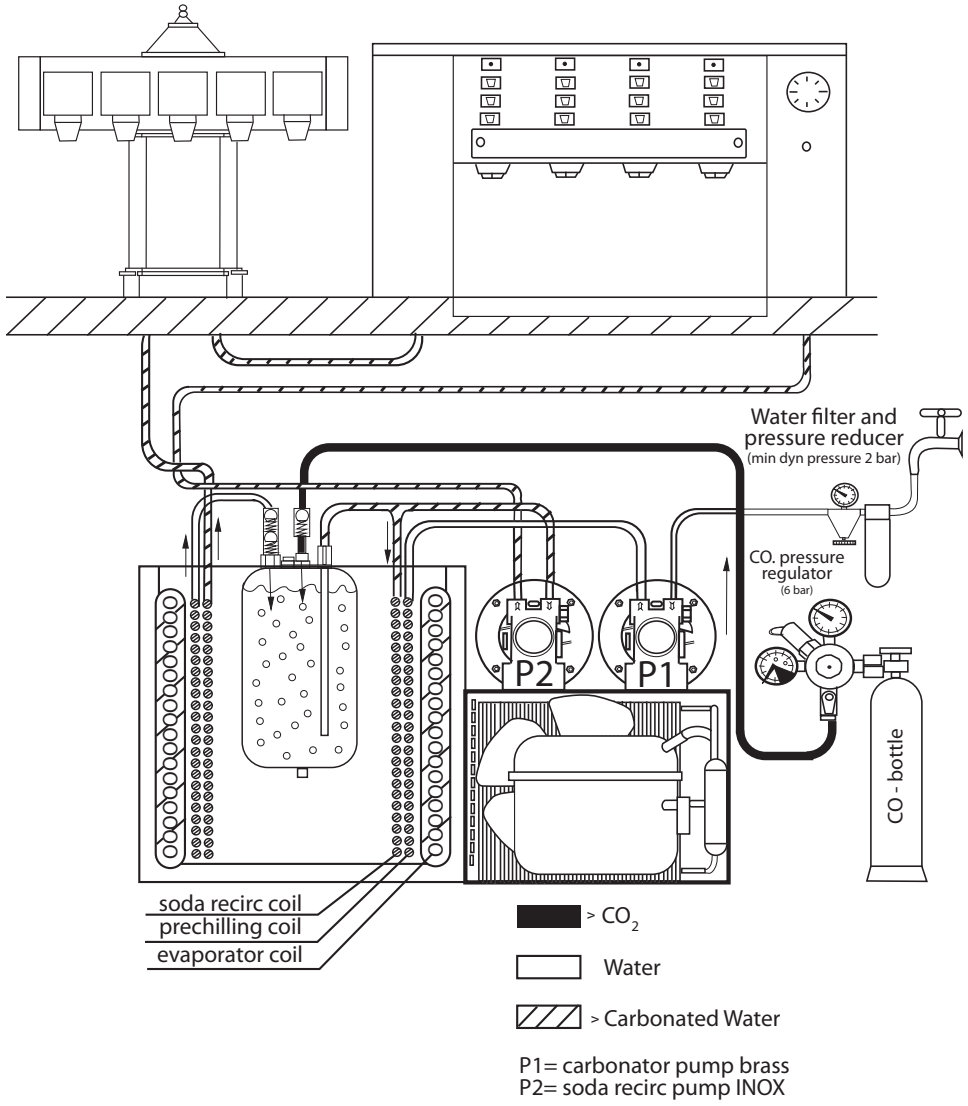
Minimum 75 PSI (5.1 BAR)
Maximum 90 PSI (6.2 BAR)

DISMANTLING / DECOMMISSIONING PROCEDURE

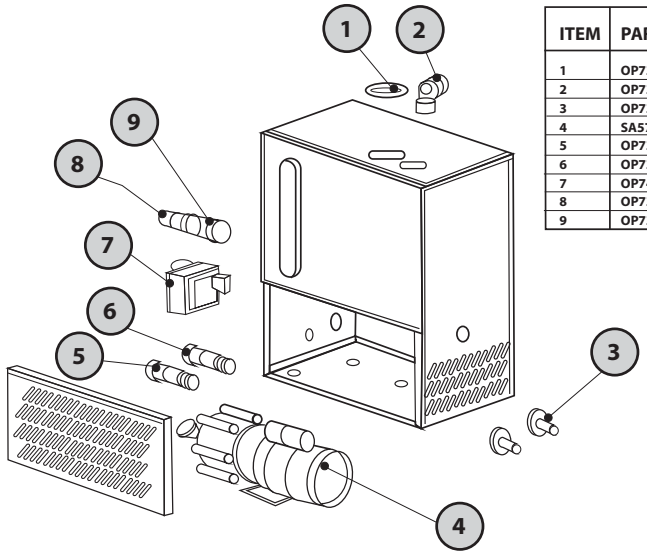
1. Isolate the unit from mains electricity supply and the mains water supply.
2. Drain off all post mix products including the syrup and carbonated water (clean syrup lines as recommended by the syrup supplier).
3. Turn the CO_2 off and disconnect all lines associated with the regulator, also vent pressure from lines by purging the product valves as required.
4. Disconnect all post mix pipework and remove dispense head equipment, including the python, and remove as recommended by the equipment owner.
5. Siphon or pump out water from the waterbath to a suitable drainage point.
6. Allow ice bank to melt (the careful use of hot water may be used to accelerate this process). Remove any remaining water from melting the ice.
7. Drain all the glycol \ water from water cooled units into a suitable container and dispose of it in accordance with the instructions given by the dispense equipment owner.

IMPORTANT:
FAILURE TO REMOVE ALL ICE / WATER COULD RESULT IN SUBSTANTIAL AMOUNTS OF WATER BEING RELEASED FROM THE UNIT WHICH MAY BE DETRIMENTAL TO THE UNIT AND/OR ITS SURROUNDINGS AND INCREASE THE MAXIMUM WEIGHT OF THE UNIT.

FLOW DIAGRAM



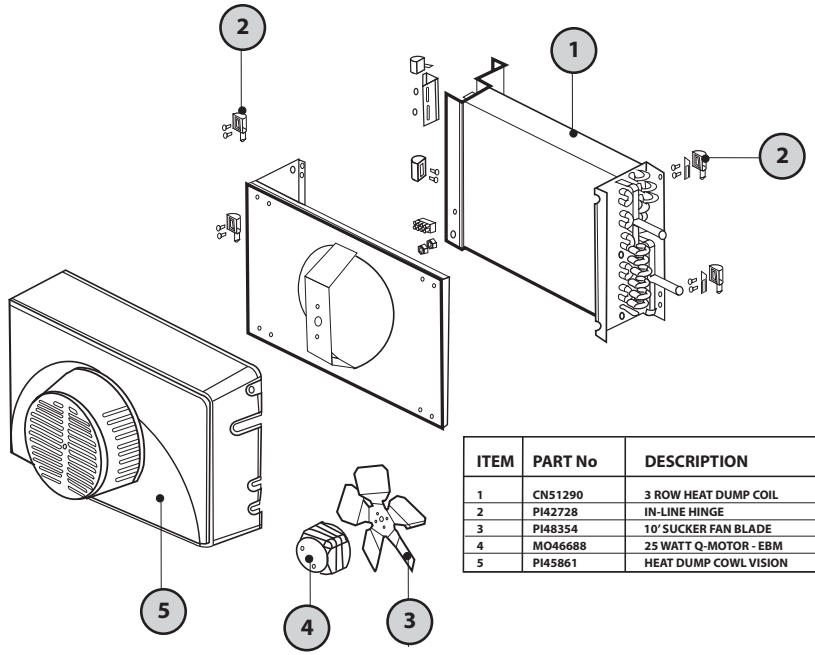
EXPLODED DRAWING AND SPARE PARTS OF GLYCOL MODULE



ITEM	PART No	DESCRIPTION
1	OP73718	FILLER PLUG
2	OP73363	15mm ELBOW
3	OP73630	BRASS TAIL
4	SA57021	3 STAGE MAG. DRIVE PUMP
5	OP73168	SHUT OFF VALVE
6	OP73326	CHECK VALVE
7	OP74396	TRANSFORMER
8	OP73829	SEALED PLUG - 2 WAY
9	OP73828	SEALED SOCKET - 2 WAY

HEIGHT = 435mm
WIDTH = 380mm
DEPTH = 220mm
DRY WEIGHT = 13kg
OPERATION WEIGHT = 25kg

EXPLODED DRAWING AND SPARE PARTS OF HEAT DUMP

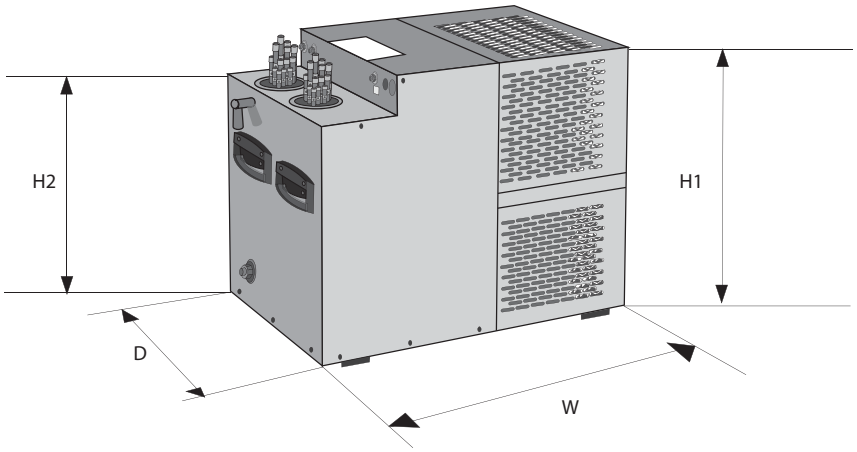


ITEM	PART No	DESCRIPTION
1	CN51290	3 ROW HEAT DUMP COIL
2	PI42728	IN-LINE HINGE
3	PI48354	10' SUCKER FAN BLADE
4	MO46688	25 WATT Q-MOTOR - EBM
5	PI45861	HEAT DUMP COWL VISION

Technical Data

	Pulsar 40i	Pulsar 60i	Pulsar 80i	Pulsar 100i
Electr. Power	230V / 50Hz 230V / 60Hz	230V / 50Hz 230V / 60Hz	230V / 50Hz 230V / 60Hz	230V / 50Hz 230V / 60Hz
Input Power	1000W	1200W	1300W	1650W
Compressor	SC12 G 12cm^3 (3/8HP) Danfoss	SC18 G 18cm^3 (2/3HP) Danfoss	SC21G 21cm^3 (4/5HP) Danfoss	CAJ4511 33cm^3 (1/3HP) Danfoss
Cooling capacity(1)	464W	684W	792W	1252W
Refrigerant **Integral** **W/Cooled**	R134a 375g 275g	R134a 375g 275g	R134a 425g 275g	R134a 1100g 800g
Water Bath	38 litres	51 litres	65 litres	114 litres
Ice-Bank Size	13.2 kg	20 kg	25 kg	50 kg
Height H1	560mm	590mm	630mm	830mm
Height H2	480mm	510mm	550mm	670mm
Width W	700mm	750mm	865mm	1100mm
Depth D	430mm	460mm	535mm	625mm
Weight (dry)	75 kg	79 kg	92 kg	145 kg
Heat Dump	9 kg (dry)			
Weight Glycol Module	13 kg (dry)			
Weight				

(1) at evaporation temp. =-10°C , condensing temp. = 55°C and ambient temp. = 32°C



INSTALLATION INSTRUCTIONS

PULSAR SODA CIRCUIT COOLER RANGE
INSTALLATION INSTRUCTIONS FOR
INTEGRAL & WATER COOLED UNITS

NOTE:
The unit should be installed and serviced by a suitably trained person.

NOTE:
Sealed plugs may be fitted to new units.

1. Unpack the unit from its transportation packing and visually check for any signs of damage.

2. Site the unit in a convenient location in the cellar or room on a level surface where it is to be located and make sure that a mains electricity supply is within 2 meters and in an area allowing free circulation of air. The unit should be fitted with a correctly fused and wired 13 amp plug fitted with the correct fuse as below or alternatively a standard Euro Plug to IEC83:1975.

Fuses for standard UK plug:

Pulsar 40i Integral & Water Cooled -10 AMP FUSE
Pulsar 60i Integral & Water Cooled -10 AMP FUSE
Pulsar 80i Integral & Water Cooled -13 AMP FUSE
Pulsar 100i Integral & Water Cooled - 13 AMP FUSE

3. If the unit is a water cooled version, the glycol module and heat dump must be installed and connected as detailed in the GLYCOL MODULE AND HEAT DUMP INSTALLATION INSTRUCTIONS on pages 14-21 in this manual before commissioning the complete system.

4. Connect the dispense head to the unit using suitable fittings and python, refering to the connection diagram on the lid of the cooler and those supplied with the dispense head.

5. Connect a mains water supply of 2.5 bar to 4 bar to the tube labelled 'WATER IN' **(do not turn on yet).**

6. Connect all products to the unit as labelled (do not connect to the syrup containers yet).

7. Connect CO_2 gas supply of 5 bar to 6.3 bar to the cooler using the tube labelled 'CO_2 IN' **(do not turn on yet).**

8. Fill the water bath with fresh clean COLD water until the overflow level is reached.

9. Connect the unit to the mains electricity supply **(do not turn on yet).**

10. Remove the top cover and turn on the CO_2 supply. Vent the carbonator bowl using the relief valve located on the top of the bowl.
Additionally, operate the dispense valve until the air in the python lines is purged.

11. Turn on the mains water supply.

12. Check for obvious leaks and rectify before proceeding any further.

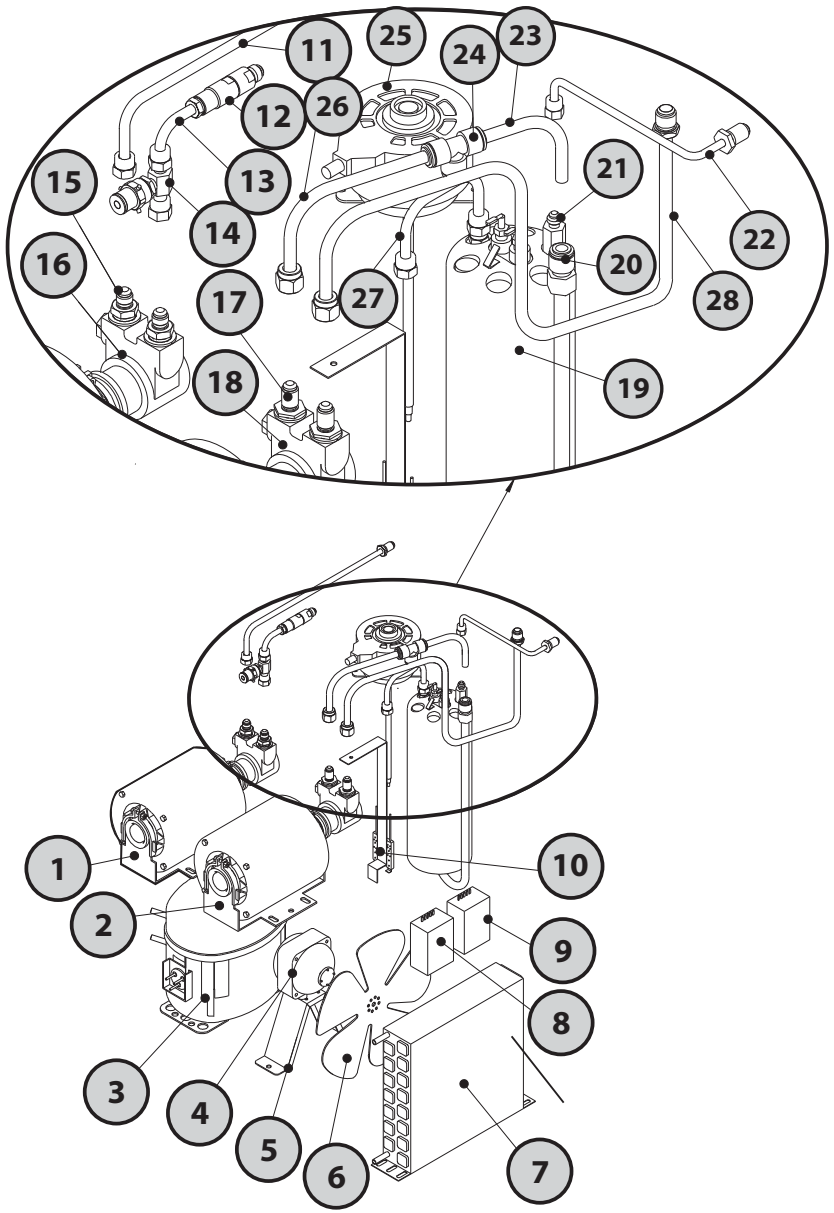
13. Ensure that the soda recirculation pump and carbonator pump are switched off.

NOTE: If the unit is a version that only has a single power on switch, unplug the carb pump & soda pump connections from the distribution board.

Pos.	description	Pulsar 40i	Pulsar 60i	Pulsar 80i	Pulsar 100i
1	motor for carbonator pump	M074685	M074685	M074685	M)74685
2	motor for circulation pump	MO46595	MO46595	MO46595	MO46595
3	compressor	CM44820	CM73570	CM73433	CM46450
4	fan motor (Integral units only)	MO46782	MO46785	MO46785	SG-85-0260
	Box fan (not shown)				
5	bracket for fan motor	PI47102	PI47103	PI47103	SG-85-0262
6	fan blade	SG-85-0168	SG-85-0082	SG-85-0082	SG-85-02612
7	condenser	SG-81-0080	SG-81-0080	CN49700	CN73348
8	ice bank control	SG-83-0009-H	SG-83-0009-H	SG-83-0009-H	SG-83-0009-H
*9	level control	SG-83-0401-H	SG-83-0401-H	SG-83-0401-H	SG-83-0401-H
10	ice bank sensor	SG-41-1925-1	SG-41-1953-1	SG-41-1470-2	SG-41-2273
11	tube "water in"			on request	
12	double check valve water	SG-42-0857-100	SG-42-0857-100	SG-42-0857-100	SG-42-0857-100
13	elbow				
14	cross piece	PI44879	PI44879	PI44879	PI44879
15	threaded adaptor	SG-42-0120	SG-42-0120	SG-42-0120	SG-42-0120 at outlet SG-33-0167-30 at inlet
16	carbonator pump (1)	SG-42-0035-30	SG-42-0035-30	SG-42-0035-30	SG-42-0035-30
17	threaded adaptor	SG-33-0167-30	SG-33-0167-30	SG-33-0167-30	SG-33-0167-30
18	circulation pump	SG-42-0127-20	SG-42-0127-20	SG-42-0127-20	SG-42-0127-20
19	carbonator bowl	SG-42-0922-20	SG-42-0922-20	SG-42-0906-30	SG-42-0906-30
20	threaded connector JOHN GUEST			on request	
21	check valve CO_2	SG-42-0955	SG-42-0955	SG-42-0955	SG-42-0955
22	tube "CO_2 in"			on request	
23	tube cross piece - carbonator bowl			on request	
24	cross piece JOHN GUEST			on request	
25	agitator motor	SG-85-0264-10	SG-85-0264-10	SG-85-0264-10	SG-85-0264-10 (2 off)
26	tube circulation pump cross piece		on request		
27	tube prechill coil carbonator bowl		on request		
28	tube soda recirc pump housing		on request		

*** : 83-0401-0001 if with carbonator pump time-out facility (1) in stainless steel on request**
Electrical components for other voltages/ frequencies than 230 VAC/50 Hz on request

For water-cooled units and versions with still water boost			
Not shown	PI51293	Plate heat exchanger	**Only for water-cooled units**
Not shown	SG-82-1006	Thermostatic expansion valve	
Not shown	SG-82-0055	Penn valve	
Not shown	SG-82-0108	Dryer-accumulator	
Not shown	SG-83-0018	High pressure switch	
Not shown	SG-83-0775-10	PCB still water boost	**Only for versions with still water boost**
Not shown	SG-83-0775-0500	PCB still water boost (via electrical demand)	
Not shown	SG-OP73971	Solenoid	
Not shown	SG-33-0462	Crosspiece for pressure switch	
Not shown	SG-OP74246	Water pressure regulator	
Not shown	SG-83-0868	Low pressure switch	



EXPLODED DRAWING AND SPARE PARTS OF PULSAR i

14. Switch on the unit at the mains power supply and allow ice bank to build. Mains plug must be accessible.

15. If the unit is a water cooled version, ensure that the glycol lines prime correctly and that the glycol module is topped up to the correct level.

16. Switch on re-connect the carbonator pump and allow the bowl to fill. Until the pump cuts out.

17. Prime the dispense head by operating the valves and ensure all pockets of CO_2 are removed from system.

18. Switch on/reconnect the soda pump.

19. Connect the syrup containers and operate dispense valves until syrup is dispensed.

20. Refit the top cover to the base unit.

21. The dispense head can now be brixed and the system will be ready to use.

HEAT DUMP AND GLYCOL MODULE INSTALLATION – WATER COOLED UNITS

HEAT DUMP - GENERAL GUIDELINES

1. It is important that the heat dump is sited correctly to enable it to work efficiently. The guidelines below should be adhered to wherever possible.

2. Ensure the unit is sited on an outside wall (preferably non south facing) in the correct orientation out of direct sunlight.

3. Ensure there are no other heat sources, i.e. a condensing unit or another heat dump, in the immediate vicinity, where hot air may be re-circulating.

4. Use the recommended tubing (15mm O/D, 10mm I/D Special EVA) to connect the base unit to the heat dump. Do not use PVC braided tube, as this is not compatible with glycol and will degrade over a period of time.

5. Do not exceed the recommended distance and lift from the base unit to the heat dump of 9m lift, 40m run.

6. The heat dump must be connected using a minimum of 1.5mm two core cable. If a smaller cable is used, a voltage drop will occur which may cause the fan motor to run at a reduced speed.

7. If the unit is to be installed inside a building or room, ensure that there is adequate ventilation within the room to enable the heat to be dissipated effectively. Temperatures within the room should not exceed 40°C

8. Do not kink the flow and return tubes which would restrict the coolant flow.

9. Do not insulate the flow and return lines.

10. The flow and return lines must not be strapped together, as heat transfer between the two will effect the system performance.

11. Ensure that the heat exchanger matrix of the heat dump is kept clean and free from obstructions. It is recommended that it should be cleaned with a soft brush at regular intervals.

12. To enable the heat dump to be mounted on a flat surface, a floor standing mounting kit is available as an option.
(Order part number 09-0203-01).

PREVENTION OF FREEZING / ACTION REQUIRED IF FREEZING OCCURS

It is recommended that all exterior Pipework to the unit is insulated to prevent freezing. In the event of freezing up occurring, the following action is recommended :

1. Isolate the unit from base coolers electricity supply.

2. Apply gentle warmth to the general area of the unit and its pipework, taking care not to scorch / burn the insulation tubing surrounding the pipes.

3. Check for obvious leaks.

4. Reconnect the base cooler mains electricity supply.

5. Observe the unit running for a short time watching out for leaks, strange noises or any form of malfunction. If no problems are observed, the normal operation of the unit may be resumed.

MAX. / MIN : ambient temperatures

Minimum -25°C
(dependant on glycol mix)
Maximum +40°C

DISMANTLING / DECOMMISSIONING PROCEDURE

1. Isolate the unit from the base cooler or glycol module electricity supply.
2. Disconnect the recirculating coolant inlet and outlet pipes.

⚠ Warning
THIS UNIT CAN CONTRIBUTE TO THE AMBIENT TEMPERATURE.

⚠ Warning
THIS UNIT IS UNSUITABLE FOR USE BY UNSUPERVISED CHILDREN, INFIRM OR AGED PERSONS.

GLYCOL MODULE INSTALLATION INSTRUCTIONS

NOTE: The unit should be installed and serviced by a suitably trained person.

1. Site the glycol pump module within 2 meters of the base unit and use the bracket supplied to secure the module to a wall. Alternatively, position the unit on a flat, level surface.

2. Connect the glycol module's power supply to the 240V power outlet socket on the base unit.
(DO NOT SWITCH ON YET)

3. Using Cobracol tubing, connect the 'COOLANT FLOW' from the glycol module to the 'COOLANT IN' on the base unit.

4. Install the heat dump as described on pages 14-21.

5. Again using Cobracol tubing connect the 'COOLANT OUT' from the base unit to the 'FLOW' on the heat dump. Connect the 'RETURN' on heat dump to the 'COOLANT RETURN' on the glycol module to complete the circuit.

6. Finally, connect the 1.5mm twin wire coming from the heat dump to the 24V outlet socket on the glycol module using the two pin plug supplied with the glycol module. It does not matter which way the wires are connected as they are not polarised.

7. Ensure the lines are correct and secured neatly and free from kinks.

8. Fill the glycol module reservoir tank with a quantity of coolant mixed 30% glycol to 70% water, ensuring a quantity remains for topping up the system when priming.

NOTE: A 30% glycol mixture is suitable for operation in temperatures as low as -12˚c. For operation in temperatures as low as -25˚c, a 50% glycol mixture is required. In the event of freezing up occurring the following action is recommended:

9. On the base unit, locate the compressor switch and ensure that it is in the 'OFF' position. This will aid with priming of the cooling system.

Alternatively, if the unit only has a power on switch, unplug the compressor plug from the distribution board.

NOTE: Maximum Lift = 9m Maximum Run = 40m

DISTANCE FROM BASE UNIT TO HEAT DUMP	APPROX. VOLUME OF GLYCOL	APPROX. VOLUME OF WATER
5m	4.25 ltr	8.25 ltr
15m	4.50 ltr	9.00 ltr
20m	4.75 ltr	9.25 ltr
30m	5.00 ltr	10.00 ltr
40m	5.40 ltr	10.60 ltr

ADJUSTMENTS/MAINTENANCE REQUIREMENTS

IT IS NOT RECOMMENDED THAT THE END USER MAKES ANY ADJUSTMENTS OR CARRIES OUT ANY MAINTENANCE OTHER THAN :

1. Check the 24V cable and connections visually for condition.
2. Check the unit and its pipework for any evidence of leaks visually.

NOTE: THERE ARE NO USER SERVICEABLE PARTS.

Methods of cleaning

TWICE ANNUALLY: By a competent service \ maintenance engineer

1. Isolate the unit from the Base Cooler electricity supply.
2. Open the unit to access both sides of the condenser matrix and remove any extraneous debris from the unit or its casing preferably using a vacuum cleaner or brush.
3. Check unit for electrical safety.

Do not use a water or steam hose to clean the unit whilst still installed.

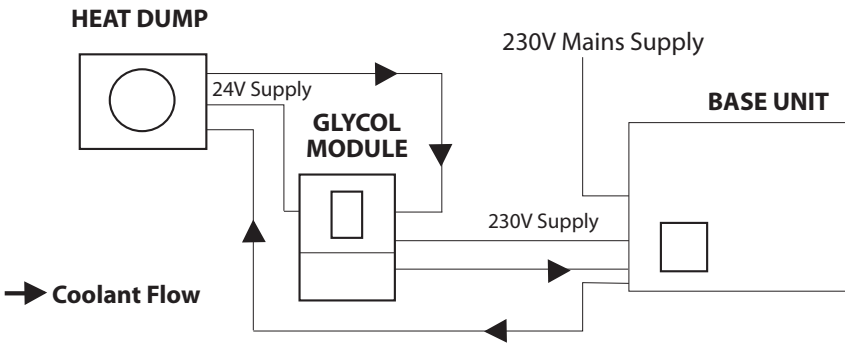
It is important that all the vents and grills are kept clear (including condenser grills where applicable).

.

10. Refer back to the base unit installation instructions on page 12 and complete the installation up to point 14. Upon switching the unit on, the pump in the glycol module will start together with the heat dump fan, the refrigeration remaining off. As the system primes, the level will drop in the coolant header tank. Keep topping this up until the system is full, there are no air locks and that coolant is returning freely into the header tank. If the system trips out on the thermal switch whilst priming, this will have to cool before it automatically restarts.

11. Switch the compressor switch to 'ON' or re-connect the compressor plug and finish the installation up to point 21.

Water cooled unit - equipment connection schematic



9. After the condenser matrix is fully fitted to the mounting surface, hang the cover/fan assembly onto its hinges.
With the cover/fan assembly open, connect the wires from the fan to the terminal block.

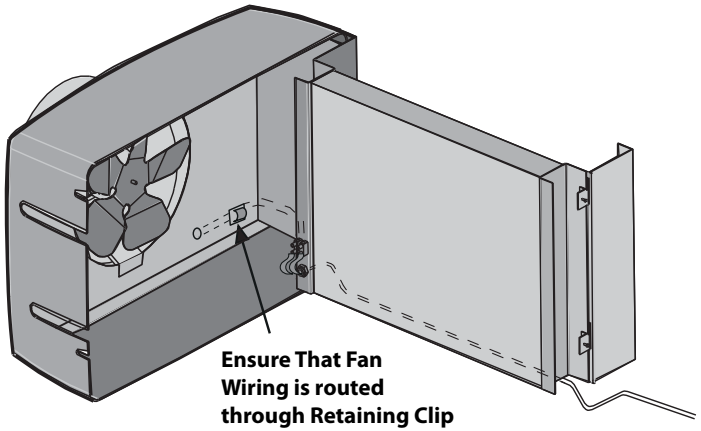
Note - Ensure that the wiring from the fan is routed through the plastic clip provided to prevent the possibility of the wires becoming entangled in the fan blade.

10. Connect the wiring and the Pipework to the cooler following the instructions supplied with the cooler.

Recommended materials for heat dump to cooler connections

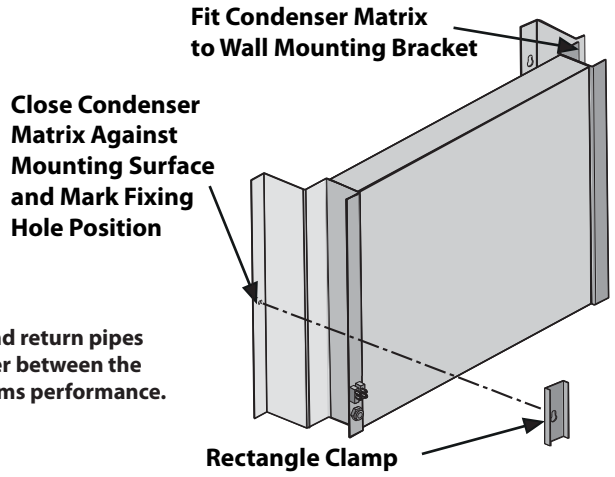
Pipework: 15mm OD x 10mm ID COBRACOL tubing.

Cable:1.5 mm sq., 2 core white PVC covered (no earth).



POWER ISOLATION METHOD
1. SWITCH OFF THE SOCKET THAT THE BASE COOLER UNIT IS INSTALLED INTO.
2. REMOVE THE PLUG FROM THE SOCKET.

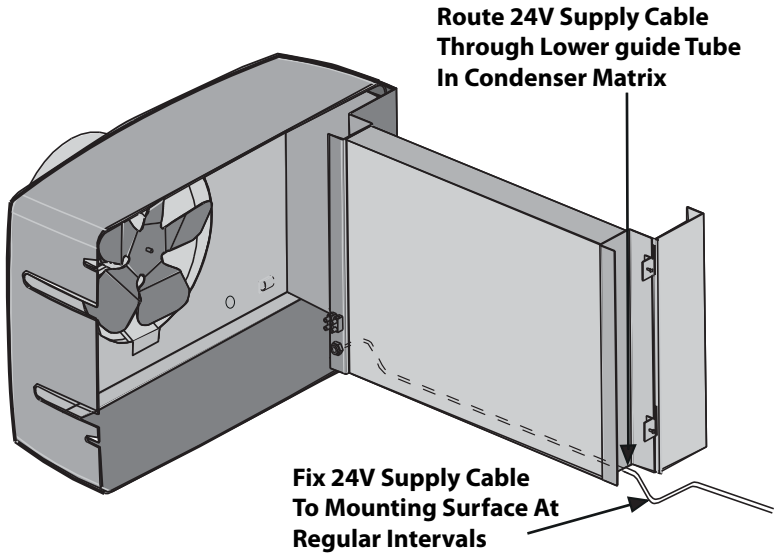
CORRECT SAFE HANDLING
HANDLING OF THIS UNIT OFFERS NO SPECIFIC HAZARD. UNIT WEIGHT 9KG (20LB) DRY.



Do not strap the flow and return pipes together as heat transfer between the two will effect the systems performance.

7. Route a twin core 24 volt supply cable (1.5mm csa) through the lower guide tube and then through the strain relief grommet positioned below the two way terminal block on the condenser matrix. The wires are not polarised and may be fitted either way round.

8. Ensure that the amount of cable entering through the main cover is not excessive and cannot become entangled in the fan blade. Tighten the strain relief grommet to support the cable. This should not be the only means of support for the cable, therefore fix back to the mounting surface at regular intervals along the cable length.



⚠ Warning

WAYS THE EQUIPMENT SHOULD BE USED
THIS UNIT IS INTENDED FOR USE IN CONJUNCTION WITH COOLING UNITS MANUFACTURED BY MANITOWOC. IT IS DESIGNED TO BE CONNECTED AT THE END OF THE WATER/GLYCOL RECIRCULATION LINES AS MEANS OF REMOVING HEAT FROM THE COOLING SYSTEM. THERE ARE NO OTHER RECOMMENDED USES FOR THIS UNIT.

⚠ Warning

ALL WATER COOLED UNITS ARE FITTED WITH AN AUTO RESET THERMAL SWITCH TO PROTECT THE COMPRESSOR.
IF A FAULT OCCURS IT IS LIKELY TO BE ONE OF THE FOLLOWING.

1. LOW WATER/GLYCOL LEVEL.
2. COOLANT LEAK
3. BLOCKAGE WITHIN COOLING SYSTEM.
4. HEAT DUMP FAN FAILURE.
5. WATER PUMP FAILURE.
6. 24V TRANSFORMER FAILURE.
7. WIRING FAULT.

THE SYSTEM WILL RESET ITSELF, BUT IF THE FAULT PERSISTS, IT SHOULD BE RECTIFIED BEFORE FURTHER OPERATION.

HEAT DUMP INSTALLATION INSTRUCTIONS

NOTE: The unit should be installed and serviced by a suitably trained person.

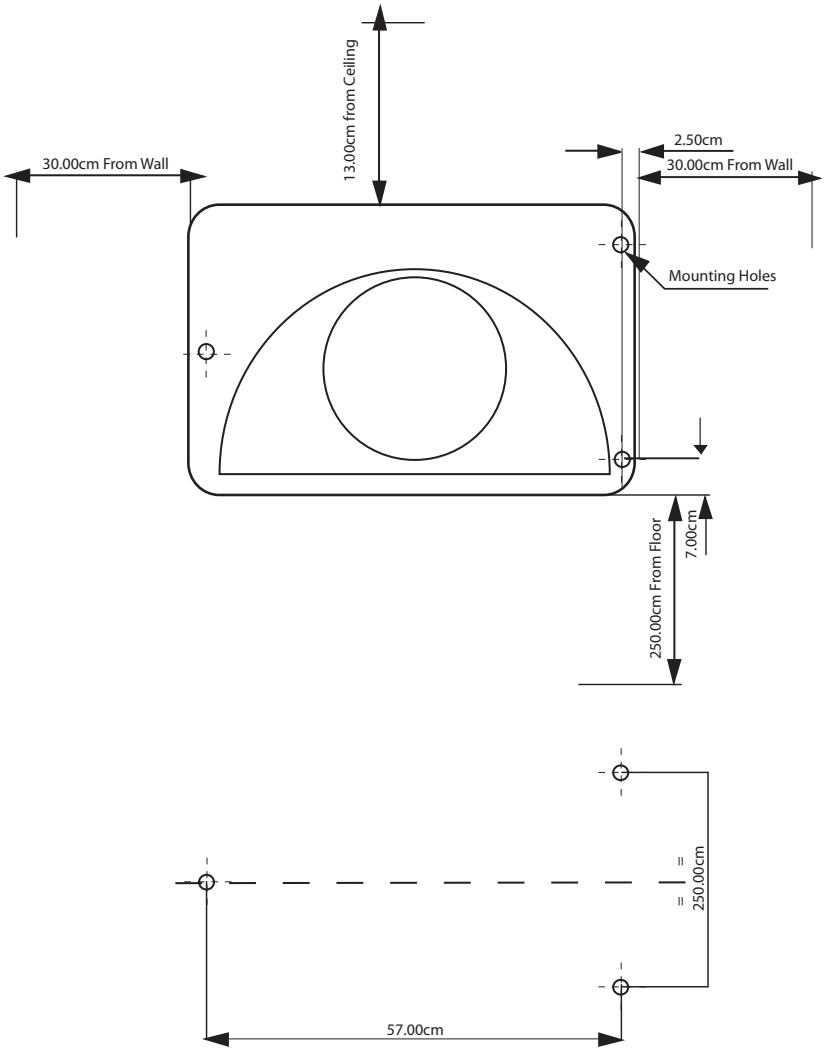
1. Unpack the unit from its transportation packaging and visually inspect for signs of damage.

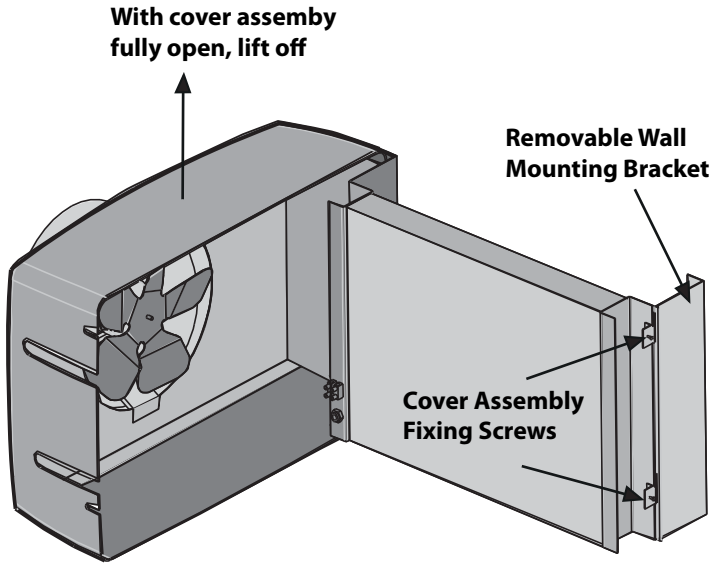
2. Site the dump in a convenient location, preferably in a non-heat sensitive and shaded area on the outside of the building. If it cannot be installed outside, ensure that the area is free from other heat sources and is adequately ventilated to prevent heat build up from the hot exhaust air from the heat dump. In either situation the heat dump should be sited to allow free circulation of air. The maximum recommended height of the heat dump above the cooler is 9 meters.

3. Remove the wall mounting bracket from the assembly, (mounted on lift off hinges). Slacken the two fixing screws securing the cover/fan assembly to the condenser matrix, swing the cover open and lift off the assembly.

4. With reference to the above drawing drill the surface onto which the heat dump is to be fitted at the stated mounting hole centers ensuring that adequate clearance is allowed around the heat dump to allow future access for cleaning. The wall mounting bracket can be used as a guide for marking its hole centers. Ensure that the wall mounting bracket is mounted squarely to ensure level movement of the condenser matrix when fitted.

Minimum distances for mounting the Heat Dump from vertical and horizontal surfaces





5. Either mark the position of the third mounting screw at the time of marking the wall mounting bracket position, or after fitting the wall mounting bracket hang the condenser matrix on, close against the mounting surface and mark the fixing position. The third fixing screw will pass through the hole in the condenser matrix. The retaining clamp is fitted over the screw which can then be tightened to retain the condenser matrix.

6. Connect the flow and return pipework from the glycol module and base unit to the fittings on the heat dump labelled "FLOW" and "RETURN". Secure the pipes to the mounting surface so that the weight of the pipes is not being carried on the heat dump fittings. Do not kink the pipework as this will restrict coolant flow. Do not insulate the pipework. (pipework mounted on an exterior surface may be insulated if it is felt that due to extreme conditions freezing may occur).